

WHAT IS CLAIMED IS:

1. A rotary electric machine comprising:

a housing; and

an armature having a shaft rotatably supported in the housing and an armature core fixedly connected to the shaft, wherein:

the armature core is formed by laminating a plurality of core sheets, each core sheet having a center hole and outer holes connected to the center hole;

the armature core is connected to the shaft by forcibly inserting the shaft into the center holes of the laminated core sheets; and

an outer surface of the shaft contacting the center holes of the laminated core sheets is a smooth surface having no knurls.

2. The rotary electric machine as in claim 1,

wherein:

the core sheets are laminated so that the outer holes of the core sheets communicate with one another, thereby forming air passages in the armature core in the axial direction thereof.

3. The rotary electric machine as in claim 2,

wherein:

the core sheets are laminated so that the outer holes of the core sheets are positioned in a shifted

relation to one another by a predetermined angle around the axial direction, thereby forming air passages skewed relative to the axial direction.

4. The rotary electric machine as in claim 3,
wherein:

the plurality of core sheets are laminated by dividing the same into a few blocks.

5. The rotary electric machine as in claim 3,
wherein:

the predetermined angle is an angle corresponding to one slot pitch.

6. The rotary electric machine as in claim 2,
wherein:

the laminated core sheets are divided into a few blocks; and

the outer holes of the core sheets are positioned at a same position in each block and are shifted block by block by a predetermined angle around the axial direction, thereby forming air passages skewed block by block relative to the axial direction in the armature core.

7. The rotary electric machine as in claim 6,
wherein:

the predetermined angle is an angle corresponding to one slot pitch.

8. The rotary electric machine as in claim 1, wherein:

the armature further having conductor segments, each conductor segment including an in-slot portion disposed in a slot formed on an outer periphery of the armature core and a coil end bent from the in-slot portion and disposed on an axial end surface of the armature core; and

the coil ends of the conductor segments are circularly arranged on the axial end surface of the armature core, thereby forming a commutator surface that contacts brushes.

9. The rotary electric machine as in claim 6, wherein:

the armature further having conductor segments, each conductor segment including an in-slot portion disposed in a slot formed on an outer periphery of the armature core and a coil end bent from the in-slot portion and disposed on an axial end surface of the armature core; and

the coil ends of the conductor segments are circularly arranged on the axial end surface of the

armature core, thereby forming a commutator surface that contacts brushes.